A marked-up copy of the amended paragraph is submitted herewith.

IN THE CLAIMS:

Please cancel Claims 1-16, without prejudice, and add the following new claims:

17. (New) A catadioptric optical system comprising:

a catadioptric type optical system, which includes a lens element, a first reflecting surface and a second reflecting surface that reflects light coming from said first reflecting surface, at least one of said first and second reflecting surfaces being a concave reflecting surface, for forming an intermediate image from an object of a first plane surface; and

a refraction type optical system for forming a second image onto a second plane surface which is substantially parallel to said first plane surface;

wherein, said first reflecting surface has an aperture portion at an off-axis position, and said catadioptric type optical system and said refraction type optical system are disposed between said first plane surface and said second plane surface.

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18. (New) A catadioptric optical system according to Claim 17, wherein said catadioptric type optical system and said refraction type optical system are disposed on a single linear optical axis.

19. (New) A catadioptric optical system according to Claim 17, wherein said catadioptric type optical system includes a lens group including at least one positive lens, and said refraction type optical system includes an aperture diaphragm.

20. (New) A catadioptric optical system according to Claim 17, wherein an exit pupil of said catadioptric optical system is substantially circular.

21. (New) A catadioptric optical system according to Claim 17, wherein the following condition is satisfied:

$0.04 < |fM1| / L < 0.4$

wherein fM1 is a focal length of said concave reflecting surface of said first or second reflecting surface, and L is a distance along the optical axis from said first surface to said second surface.

22. (New) A catadioptric optical system according to Claim 17, wherein the following condition is satisfied:

$0.6 < |\beta M1| < 20$

wherein $\beta M1$ is a magnification of said concave reflecting surface of said first or second reflecting surface.

23. (New) A catadioptric optical system according to Claim 17, wherein the following condition is satisfied:

$0.3 < |\beta 1| < 1.8$

wherein $\beta 1$ is a magnification of said catadioptric type optical system.

24. (New) A catadioptric optical system according to Claim 17, wherein said catadioptric type optical system includes a lens group including at least one lens element whose surface is asymmetric, and said refraction type optical system includes at least one lens element whose surface is asymmetric.

25. (New) A catadioptric optical system according to Claim 17, wherein at least one of said first and second

reflecting surfaces is a concave reflecting surface that corrects positive Petzval sum created by said lens element.

26. (New) A catadioptric optical system according to Claim 17, wherein the catadioptric optical system has both-sides telecentricity.

27. (New) A catadioptric optical system according to Claim 17, wherein said refraction type optical system includes two kinds of glass material.

28. (New) A projection exposure apparatus, wherein a catadioptric optical system according to Claim 17 projects a predetermined pattern on a mask onto a photosensitive substrate.

29. (New) A catadioptric optical system comprising:

a catadioptric type optical system, which includes a lens element, a first reflecting surface and a second reflecting surface that reflects light coming from said first reflecting surface, light coming from said second reflecting surface passing said first reflecting surface off-axis thereof, at least one of said first and second reflecting surfaces being a

concave reflecting surface, for forming an intermediate image from an object of a first plane surface; and

a refraction type optical system for forming a second image onto a second plane surface which is substantially parallel to said first plane surface,

wherein, said catadioptric type optical system and said refraction type optical system are disposed between said first plane surface and said second plane surface.

30. (New) A catadioptric optical system according to Claim 29, wherein said catadioptric type optical system and said refraction type optical system are disposed on a single linear optical axis.

31. (New) A catadioptric optical system according to Claim 29, wherein said catadioptric type optical system includes a lens group including at least one positive lens, and said refraction type optical system includes an aperture diaphragm.

32. (New) A catadioptric optical system according to Claim 29, wherein an exit pupil of said catadioptric optical system is substantially circular.

33. (New) A catadioptric optical system according to Claim 29, wherein the following condition is satisfied:

$0.04 < |fM1| / L < 0.4$

wherein fM1 is a focal length of said concave reflecting surface of said first or second reflecting surface, and L is a distance along the optical axis from said first surface to said second surface.

34. (New) A catadioptric optical system according to Claim 29, wherein the following condition is satisfied:

$0.6 < |\beta M1| < 20$

wherein ßM1 is a magnification of said concave reflecting surface of said first or second reflecting surface.

35. (New) A catadioptric optical system according to Claim 29, wherein the following condition is satisfied:

$0.3 < |ß1| < 1.8$

wherein ß1 is a magnification of said catadioptric type optical system.

36. (New) A catadioptric optical system according to Claim 29, wherein said catadioptric type optical system includes a lens group including at least one lens element whose surface is asymmetric, and said refraction type optical system includes at least one lens element whose surface is asymmetric.

37. (New) A catadioptric optical system according to Claim 29, wherein at least one of said first and second reflecting surfaces is a concave reflecting surface that corrects positive Petzval sum created by said lens element.

38. (New) A catadioptric optical system according to Claim 29, wherein the catadioptric optical system has both-sides telecentricity.

39. (New) A catadioptric optical system according to Claim 29, wherein said refraction type optical system includes two kinds of glass material.

40. (New) A projection exposure apparatus which projects a predetermined pattern on a mask onto a photosensitive substrate, wherein said catadioptric optical

system according to Claim 12, projects said predetermined pattern onto said photosensitive substrate.

41. (New) A method of manufacturing an electric device using a projection exposure apparatus including a catadioptric optical system according to Claim 29, that projects a predetermined pattern on a mask onto a photosensitive substrate.

42. (New) A method of manufacturing a catadioptric optical system comprising the steps of:

providing a catadioptric type optical system, which includes a lens element, a first reflecting surface and a second reflecting surface that reflects light coming from said first reflecting surface, light coming from said second reflecting surface passing said first reflecting surface off-axis thereof, at least one of said first and second reflecting surfaces being a concave reflecting surface, for forming an intermediate image from an object of a first plane surface; and

providing a refraction type optical system for forming a second image onto a second plane surfac which is substantially parallel to said first plane surface,

wherein, said catadioptric type optical system and said refraction type optical system are disposed between said first plane surface and said second plane surface.

43. (New) A method of manufacturing a catadioptric optical system according to Claim 42, wherein said catadioptric type optical system and said refraction type optical system are disposed on a single linear optical axis.

44. (New) A method of manufacturing a catadioptric optical system according to Claim 42, wherein said catadioptric type optical system includes a lens group including at least one positive lens, and said refraction type optical system includes an aperture diaphragm.

45. (New) A method of manufacturing a catadioptric optical system according to Claim 42, wherein an exit pupil of said catadioptric optical system is substantially circular.

46. (New) A method of manufacturing a catadioptric optical system according to Claim 42, wherein said catadioptric type optical system includes a lens group including at least one lens element whose surface is

asymmetric, and said refraction type optical system includes at least one lens element whose surface is asymmetric.

47. (New) A catadioptric optical system according to Claim 42, wherein at least one of said first and second reflecting surfaces is a concave reflecting surface that corrects positive Petzval sum created by said lens element.

48. (New) A catadioptric optical system according to Claim 42, wherein the catadioptric optical system has both-sides telecentricity.

49. (New) A catadioptric optical system according to Claim 42, wherein said refraction type optical system includes two kinds of glass material.

50. (New) A catadioptric optical system comprising:

a catadioptric type optical system, which includes a lens element, a first reflecting surface and a second reflecting surface that reflects light coming from said first reflecting surface, at least one of said first and second reflecting surfaces being a concave reflecting surface, for forming an